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## Druckexemplar

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NEW CLAIMS

- 1) A method for the production of rails and similar products with a rolling plant, wherein the plant comprises a reversible intermediate working station (3),  
5 the intermediate working station (3) comprising a first (30) and a second universal stand (32),  
a high edging stand (31) placed between said first and second universal stand (30, 32), the intermediate working station (3) being able to receive a pre-rough rolled bar from an appropriate upstream rough rolling station (2) and to deliver it, after  
10 having worked it, to a downstream finishing station (4),  
the method comprising, in the order indicated, the following operations:  
a first rolling passage (U1) in said second universal stand (32);  
a first rolling passage (E1) in said high edging stand (31);  
a first rolling passage (U2) in said first universal stand (30),  
15 characterised by the fact that said three stands (30, 31, 32) are placed at such a distance between each other that said bar can be held simultaneously in all three of said stands (30, 31, 32) during rolling operations.
- 2) The method according to claim 1, characterised by the fact that said first rolling passage (U1) in said second universal stand (32) is performed with a reduction ratio (p1) greater than the reduction ratio (p2) with which is performed said first rolling passage (U2) in said first universal stand (30).
- 20 3) The method according to claim 2, characterised by the fact that said reduction ratio (p1) with which is performed said first rolling passage (U1) in said second universal stand (32) is comprised of between around 10% and around 30%, and said reduction ratio (p2) with which is performed said first rolling passage (U2) in said first universal stand (30) is comprised of between around 3% and around 25%.
- 25 4) The method according to claim 3, characterised by the fact that said reduction ratio (p1) with which is performed said first rolling passage (U1) in said second universal stand (32) is equal to around 20%, and said reduction ratio (p2) with which is performed said first rolling passage (U2) in said first universal stand (30) is equal to around 10%.

- 5) The method according to one or more of the preceding claims, characterised by the fact that said first rolling passage (U1) in said second universal stand (32) is preceded by a second rolling passage (E2) in said high edging stand (31).
- 6) The method according to one or more of the preceding claims, characterised by  
5 the fact that following said first rolling passage (U1) in said second universal stand (32) and prior to said first rolling passage (E1) in said high edging stand (31) is carried out on said bar for rolling a second rolling passage (U3) in said second universal stand (32).
- 7) The method according to claim 6, characterised by the fact that said second rolling passage (U3) in said second universal stand (32) is performed with a reduction ratio (p3) comprised of between around 10% and around 30%.
- 8) The method according to one or more of the preceding claims, characterised by the fact that following said first rolling passage (U2) in said first universal stand (30) is performed a third rolling passage (E3) in said high edging stand (31).
- 15 9) The method according to one or more of the preceding claims, characterised by the fact that immediately following said first rolling passage (U2) in said first universal stand (30), in said first universal stand (30) is performed a second rolling passage (U4).
- 10) The method according to claim 9, characterised by the fact that said second rolling passage (U4) carried out in said first universal stand (30) is performed with 20 a reduction ratio (p4) comprised of between around 3% and around 20%.
- 11) The method according to one or more of the preceding claims, characterised by the fact that said third rolling passage (E3) in said high edging stand (31) is successive to said second rolling passage (U4) in said first universal stand (30).
- 25 12) The method according to one or more of the preceding claims, characterised by the fact of comprising a series of operations substantially constituted of the following rolling passages, in the sequence indicated:  
said second rolling passage (E2) in said high edging stand (31) on exiting from said pre-rough rolling station (2)
- 30 said first rolling passage (U1) in said second universal stand (32)  
said second rolling passage (U3) in said second universal stand (32)  
said first rolling passage (E1) in said high edging stand (31)

said first rolling passage (U2) in said first universal stand (30)  
said second rolling passage (U4) in said first universal stand (30).  
said third rolling passage (E3) in said high edging stand (31),  
A rolling passage (UF) in said finishing station (4).

- 5 13) A method for the production of rails and similar products through rolling comprising a finishing operation (UF) of a bar transformed to a semi-worked rail, characterised by the fact that said finishing operation (UF) comprises a rolling passage in a universal stand (4) fitted with a first vertical roll (402, 422) able to work the base (B) of said rail, and a second vertical roll (403, 423) able to work the head (T) of said rail, and said first and second vertical rolls are able to roll the head (T) and said base (B) simultaneously.
- 10 14) The method according to claim 13, characterised by the fact that said finishing operation (UF) is performed with a reduction ratio ( $\rho F$ ) comprised of between around 1% and around 15%.
- 15 15) The method according to claims 13 and/or 14, characterised by the fact that said vertical rolls (403, 423) able to work said head (T) of said semi-worked rail is able to roll rails comprising a head (T) comprising a central rollable surface (T1), able to vertically support the wheels of a railway vehicle
- 20 two lateral flanks (T2, T3) located or vertically or with a slight inclination with respect to vertical when said rail is installed, and able to supply a lateral support to said wheels of said railway vehicle  
two curved joining area (T4, T5), each of which gradually joins said central surfaces (T1) to one of said lateral flanks (T2, T3),  
25 and said vertical rolls (403, 423) able to work said head (T) of said semi-worked rail comprising a rolling groove which in turn comprises a central zone able to deform and refinish said central rollable surfaces (T1)
- 16) The method according to claim 15, characterised by the fact that said rolling groove of said vertical rolls (403, 423), able to work said head (T) of said semi-worked rail, comprising two lateral surfaces, placed to the sides of said central areas and able to contain and conform said lateral flanks (T2, T3) of said head (T) of said semi-worked rail.

- 17) A rolling plant for the implementation of a method according to one or more preceding claims, said plant comprising a reversible intermediate working section (3) able to receive a pre-rough rolled bar from an appropriate upstream rough rolling station (2) and to supply it, after having worked it, to a downstream finishing station (4), where said intermediate working section (3) comprises, located in succession along at least one rolling axis, a first universal stand (30) and a high edging stand (31), comprising a second universal stand (32) located, along said at least one rolling axis, such that said high edging stand (31) is placed between said first and second universal stands (30, 32), characterised by the fact that said three stands (30, 31, 32) are located at such distances from each other that said bar can be held simultaneously in all three said stands (30, 31, 32) during rolling operations.
- 10 18) A plant according to claim 17, characterised by the fact that said three stands (30, 31, 32) of said intermediate rolling section (3) are placed one after the other, without the interposition of further rolling stands.
- 15 19) A plant according to claims 17 and/or 18, characterised by the fact of comprising a finishing station (4) comprising in turn a finishing stand placed at such a distance from said intermediate working section (3) that, when said finishing stand works a finishing passage on said bar (UF), said bar is not held in any of the said stands (30, 31, 32) of said intermediate working section (3).
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